عنوان مقاله:

Oscillating motion of triangular cylinder in a viscous fluid

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خلاصه مقاله:

The system consisting of two rigid bodies in a viscous fluid is considered. The main body with mass is placed in a viscous incompressible fluid, and the body with mass moves inside the main body. This system is known as vibrobot which can be used in arbitrary inspection fluid mechanic objects such as oil industries pipes and tanks, as well as marine industries, medicine, etc. In this paper, the interaction between the vibrobot and viscous fluid is studied to achieve the motion laws of the vibrobot with the harmonic oscillation of internal mass. Also the flow structure around vibrobot and its effects on the hydrodynamic force acting on the vibrobot are investigated. Analyses are carried out by direct numerical simulation of the vibrobot motion in a viscous fluid by OpenFOAM package. Calculations are performed for the following combinations of control parameters; The ratio of the viscous fluid mass to the vibrobot mass , the ratio of the internal mass to the vibrobot mass and dimensionless oscillation frequency , when Reynolds number takes values in the range of . Calculations have been performed with different initial approximations, .determined by different initial velocities of the incident flow

کلمات کلیدی:

Triangular cylinder, Harmonic oscillation, Movable internal mass, Numerical simulation, OpenFOAM, Viscous fluid